

Review OF THE ATTEMPT TO MANUFACTURE
IRON AT LYNN & BRAINTREE IN MASS. AND
THE SUCCESSFUL ENTERPRISE AT TAUNTON
IN THE OLD COLONY

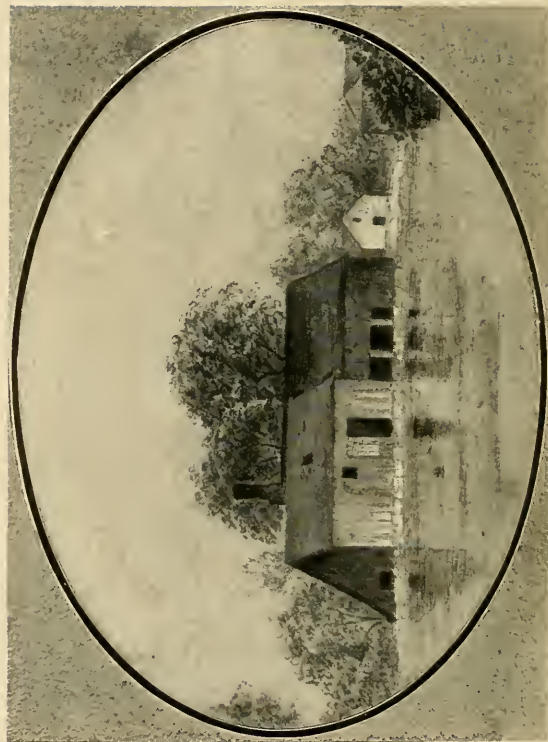
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TAUNTON BLOOMERY, 1653
FIRST SUCCESSFUL IRON WORKS IN THE
UNITED STATES

*Old Colony Historical Society, Taunton,
Mass. Executive Committee of the
Leonard Family Meeting.*

A REVIEW

OF THE

ATTEMPT TO MANUFACTURE IRON

AT

LYNN & BRAINTREE

IN MASSACHUSETTS

AND THE

SUCCESSFUL ENTERPRISE

AT

TAUNTON

IN THE OLD COLONY

PUBLISHED IN THE INTEREST OF THE

MEMORIAL TO HENRY AND JAMES LEONARD

IRON MASTERS

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ANNOUNCEMENT is hereby made that preliminary arrangements are nearly completed for the quarterly meeting of the **OLD COLONY HISTORICAL SOCIETY**, to be holden at Historical Hall, Taunton, Mass., on Wednesday, July 10, 1901, at 10 A. M., commemorative of James and Henry Leonard, early settlers of Taunton.

The Executive Committee is empowered not only to arrange for the presentation of material relating to the family history but for the formation of a plan which involves the erection of a memorial in honor of the first iron-masters.

The remarkable development of the iron industry in recent years, with the interesting history of its establishment in this country, appeals especially to all who are to-day associated in the maintenance of its prosperity, and gives assurance of much interest in the purposes of this meeting and memorial.

Per order of the Executive Committee of the Leonard Family Meeting.

JOB M. LEONARD,
THOMAS J. LOTHROP,
WILLIAM J. HOWARD,
EDWARD KING,
CLARENCE E. LEONARD,
LEWIS A. LEONARD.

17012

DISCOVERY OF IRON ORE

AND

FIRST ATTEMPT BY EUROPEANS TO MANUFACTURE IRON IN THE UNITED STATES.

NORTH CAROLINA first gave to Europeans the information that iron ore existed within the limits of the United States. The discovery was made in 1585 by the expedition fitted out by Sir Walter Raleigh and commanded by Ralph Lane, which made on Roanoke Island in that year the first attempt to plant an English settlement on the Atlantic coast. In his *History of American Manufactures*, Bishop states that "Lane and his men explored the country along the Roanoke and on both sides from Elizabeth river to the Neuse." Thomas Harriot, the historian of the colony and the servant of Sir Walter, says that "in two places of the countrey specially, one about foure score and the other sixe score miles from the fort or place where wee dwelt, wee founde neere the water side the ground to be rockie, which, by the triall of a minerall man, was founde to hold iron richly. It is founde in manie places of the countrey else. I know nothing to the contrarie but that it maie bee allowed for a good marchantable commoditie, considering there the small charge for the labour and feeding of men; the infinite store of wood; the want of wood and deerenesse thereof in England; and the necessity of ballasting of shippes." But no attempt was made to utilize this discovery, as the colonists were in search of gold and not iron. In 1586 they quarreled with the Indians and returned to England. A permanent settlement in North Carolina was not effected until many years afterwards. Iron ore was not mined in North Carolina nor was iron made within its boundaries until after many of the other colonies had commenced to make iron.

In 1607 the first permanent English colony in the New World was founded at Jamestown in Virginia by the Virginia Company of London, and on the 10th of April in the following year, 1608, the company's ship, commanded by Captain Christopher Newport, sailed from Jamestown loaded with iron ore, sassafras, cedar posts, and walnut boards, and on the 20th of May it arrived in England. From Neill's history of the company we learn that the iron ore was smelted, and "seventeen tons of metal were sold at £4 per ton to the East India Company." This was undoubtedly the first iron made by Europeans from American ore. In 1610 Sir Thomas Gates, who had spent some time in Virginia, testified before the council of the company, at London, that there were divers minerals, especially "iron oare," in Virginia, lying upon the surface of the ground, some of which ore, having been sent home, had been found to yield as good iron as any in Europe. The iron here referred to was that which had been sold to the East India Company.

In 1619 the Virginia Company sent to Virginia a number of persons who were skilled in the manufacture of iron, to "set up three iron works" in the colony. The enterprise was undertaken in that year and located on Falling creek, a tributary of the James river, which it enters on its right or southern bank in Chesterfield county, about seven miles below Richmond and about sixty-six miles above Jamestown. In 1620, as stated by Beverley in his *History of Virginia*, "an iron work at Falling creek in James river" was set up, "where they made proof of good iron ore and brought the whole work so near a perfection that they writ word to the company in London that they did not doubt but to finish the work and have plentiful provision of iron for them by the next Easter," in the spring of 1621. But neither plentiful provision nor any other provision of iron was made on Falling creek in 1621, owing to the death of three of the master workmen who had the enterprise in charge. In July of that year the company sent over John Berkley, "formerly of Beverstone Castle, Gloucester, a gentleman of an honorable family," to take charge of the work. He was accompanied by his son Maurice and twenty experienced workmen. In a letter from the company to the colonial authorities, dated July 25, 1621, it was stated that "the advancement of the iron works we esteeme to be most necessarie, by perfecting whereof we esteeme the plantation is gainer. We therefore require all possible assistance be given to Mr. Berkley now sent, and all furtherance to his ship, especially good entainment at their landinge." On the 12th of August of the same year the company, in a communication to the authorities, wrote respecting the iron works and the

saw mills which had been projected : "We pray your assistance in the perfecting of these two workes ; the profitt will redound to the whole collony, and therefore it is necessary that you extend your authoritie to the utmost limitts to enforce such as shall refuse to help to a business so much tending to the generall good." On the 5th of December, 1621, the company again wrote, enjoining "all possible dilligence and industrious care, to further and accomplish those great and many designes of salte, sawinge mills, and iron." In January, 1622, the authorities wrote to the company that "the care we have taken of the iron workes we reserve to be reported by Mr. Thresurer and Mr. Barkley himself." On June 10th the company wrote of "the good entrance w^{ch} we have understood you have made in the iron works and other staple comodities," and added, "let us have at least by the next returnes some good quantitie of iron and wyne."

But before this last letter was written the colony had been visited by the Indian massacre of the 22d of March, 1622, in which John Berkley and all his workmen were slain and the works were destroyed. These works were not rebuilt. Beverley, writing in 1705, says that the project of iron works on Falling creek "has never been set on foot since, till of late ; but it has not had its full trial." In 1624 the charter of the Virginia Company was revoked. And thus disastrously ended the first attempt by Europeans to make iron in America.

BEGINNING OF THE MANUFACTURE OF IRON IN LYNN, BRAINTREE AND TAUNTON.

ALTHOUGH iron ore in this country was first discovered in North Carolina and the manufacture of iron was first undertaken in Virginia, the first successful iron works were established in the province of Massachusetts Bay. In 1632 mention is made by Morton of the existance of "iron stone" in New England, and in November, 1637, the general court of Massachusetts granted to Abraham Shaw one-half of the benefit of any "coles or yron stone w^{ch} shal be found in any common ground w^{ch} is in the countryes disposing." Iron ore had been discovered in the flat meadows on the upper parts of the Saugus river, near Lynn, soon after its settlement in 1629, and in 1642 specimens were taken to London by Robert Bridges in the hope that a

company might be formed for the manufacture of iron. This hope was soon realized in the formation of "The Company of Undertakers for the Iron Works," consisting of eleven English gentlemen, who advanced £1,000 to establish the works. John Winthrop, Jr., had previously gone to England, and he appears to have assisted Mr. Bridges in securing the organization of the company, becoming a member of the company, as did others among the colonists. Mr. Endicott, of Salem, in a letter to Governor Winthrop, dated December 1, 1642, says: "I want much to hear from your son's iron and steel." Thomas Dexter and Robert Bridges, both of Lynn, were among the original promoters of the enterprise. In his *History of Lynn* (1844) Alonzo Lewis says that in 1643 "Mr. John Winthrop, Jr., came from England with workmen and stock to the amount of one thousand pounds for commencing the work. A foundry was erected on the western bank of the Saugus river. The village at the foundry was called Hammersmith by some of the principal workmen, who came from a place of that name in England." In Newhall's revision of Lewis's history, published in 1865, the iron works are said to have been located near the site of the present woolen factories in Sagus Centre, not far from Lynn, where large heaps of scoria are still to be seen. "This iron foundry at Lynn" says Lewis, "was the first which was established in America." Iron is not now manufactured at or near Lynn, except in its secondary forms. There are here large iron foundries, and also wire works, nail works, and various other iron enterprises of a reproductive character.

In 1644 and subsequently, as stated by Lewis, the general court granted many special privileges to the company. On March 7, 1644, it was granted three miles square of land at each of six places it might occupy in the prosecution of its business. On November 13, 1644, it was allowed three years "for y^e perfecting of their worke and furnishing of y^e country with all sorts of barr iron." The citizens were granted liberty to take stock in the enterprise "if they would complete the finery and forge, as well as the furnace, which is already set up." On May 14, 1645, the general court passed an order declaring that "y^e iron worke is very successful (both in y^e richness of y^e ore and y^e goodness of y^e iron)" and that between £1,200 and £1,500 had already been disbursed, "with which y^e furnace is built, with that which belongeth to it, . . . and some tuns of sewe iron cast in readines for y^e forge. . . . There will be neede of some £1,500 to finish y^e forge." On October 14th of the same year the company was granted still further privileges by the general court, on the condition "that the inhabitants of this jurisdiction be furnished

with barr iron of all sorts for their use, not exceeding twentye pounds per tunn," and that the grants of land already made should be used "for the building and setting up of six forges, or furnaces, and not bloomaries onley." The grant was confirmed to the company of the free use of all materials "for making or moulding any manner of gunnes, potts, and all cast-iron ware." On May 6, 1646, Richard Leader, the general agent of the company, who is described as being a man of superior ability, purchased "some of the country's gunnes to melt over at the foundery." On August 4, 1648, Governor Winthrop wrote from Boston to his son, who had removed to Pequod, Connecticut, that "the iron work goeth on with more hope. It yeilds now about 7 tons per week." On September 30th he writes again: "The furnace runs 8 tons per week, and their bar iron is as good as Spanish."

Newhall quotes from a Lynn account book for 1651 the following entry: "James Leonnarde, 15 days worke about finnerey chimneye and other worke in y^e forge, 1 : 13 : 0. To ditto Leonard for dressing his bellows 3 times, 1 : 10 : 0." Edward Johnson, of Woburn, in describing Lynn in 1652, in his *Wonder Working Providence*, printed in 1654 says that "there is also an iron mill in constant use;" and Mr. Lewis states that, prior to 1671, "the iron works for several years were carried on with vigor, and furnished most of the iron used in the colony." After 1671 they were fitfully operated, and about 1688 they appear to have been finally abandoned. Their owners were harassed after 1651 with frequent lawsuits, arising from the overflow of the water in the dam. The fear that the works would create a scarcity of timber also appears to have added to their unpopularity. Rev. William Hubbard, in his *Present State of New England*, printed in 1677 says that "a work was set up at Lynn upon a very commodius stream, which was very much promoted and strenuously carried on for some time, but at length, instead of drawing out bars of iron for the country's use, there was hammered out nothing but contentions and lawsuits."

From the foregoing details it is plainly established that the enterprise at Lynn embraced a blast furnace, or "foundery," and a refinery forge. The term foundery was long a synonym for furnace, castings being made directly from the furnace, as has been previously stated. This usage continued in this country down to about the middle of the present century, and it is still followed in some European countries. That the furnace was in operation in May, 1645, is certain, and that the forge was in operation in September, 1648, is equally certain. These dates may be accepted as definately determining,

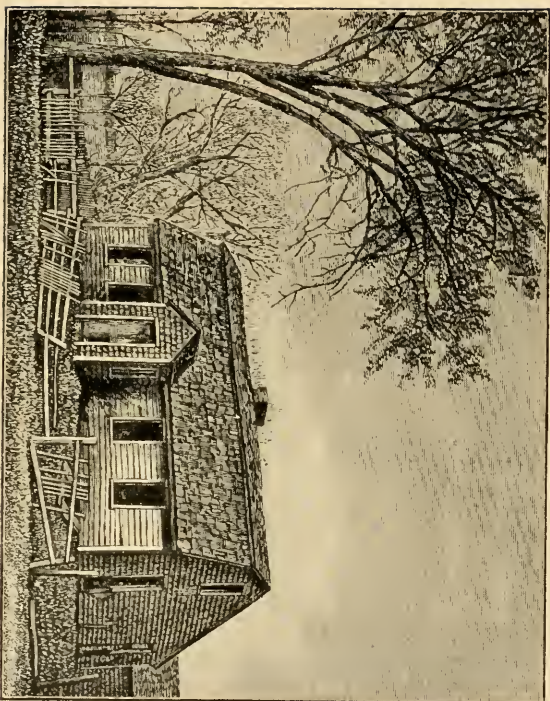
respectively, the first successful attempts in this country to make "sowe iron" and other castings in a blast furnace and to make "barr iron" in a refinery forge from "sowe iron."

Mr. Nathan M. Hawkes, of Lynn, furnished to the *Magazine of American History* for November, 1889, the following description of the exact site of the Lynn iron works.

Midway between Salem and Boston, the first and second capitals of Massachusetts, there flows a serpentine little stream called the Saugus by the Indians and their English successors. Tide-water meets the down-flowing fresh water two miles from the bay between Round Hill on the west and the dark forest on the east. Just where the currents lap each other on the bank of the stream is a long sloping mound like a sea-serpent's back, which to the passer-by seems but a freak of nature. The hand of man, however, wrought that earth-work. At this point was the upper ferry crossed in the early days by Endicott and Winthrop and all the Puritan worthies in the infancy of New England. The mound which lies at this point upon the river-bank, and is known to the natives as "the cinder banks," is the heaped-up scoria—the refuse, the remainder, the sweepings of an iron foundry which was in full blast before the red man had cast his last lingering look upon his beloved river and upon the blue waters of the Atlantic beyond. The fleecy snows have mantled it, the sun has scorched it for two centuries, and only an occasional curious observer has disturbed its scanty covering of vegetation for some relic of the first manufacturing industry of the continent.

The bog ore was largely taken from the meadows of the farms of Mr. Adam Hawkes, two miles north of the works. Mr. Hawkes furnished the ore, and he was also the persistent plaintiff in many suits against the company for flowing his lands. It is an interesting fact that, while the Puritans abandoned all the mother country restrictions concerning the conveyance of land, these fields that became the property of Adam Hawkes, and the site where he built his first house, about 1630, have never been alienated from his family, but are still occupied by his lineal descendants and are yet in the same name. This tenacity of holding is an English trait, but it is rare even in New England to witness a land tenure so long unbroken.

Joseph Jenks was a machinist at the Lynn works who had come from Hammersmith in England and was a man of much skill and inventive genius. He prepared the moulds for the first castings that were made at Lynn. "A small iron pot, capable of containing about one quart," was the first article



HOME OF JAMES LEONARD

1653

TAUNTON, MASSACHUSETTS

cast at the furnace. In 1844 it was in the possession of Mr. Lewis's mother, who was a lineal descendent of Thomas Hudson, the first owner of the lands on Saugus river on which the iron works were built, and who obtained possession of the pot immediately after it was cast, "which he preserved as a curiosity." "It has been handed down in the family ever since," wrote Mr. Lewis in 1844. Mr. C. M. Tracy, of Lynn, writes us in 1890 that by carelessness years ago one leg of the pot was broken off, when a leaden one was made and clumsily substituted, but the remainder of the pot "is perfect to-day." "It is of the old dinner-pot pattern," adds Mr. Tracy, "and, although holding only about a quart, is heavy enough to make three in the hands of a modern founder." This first iron utensil cast in this country is now in the possession of two sons of Alonzo Lewis, residing at Etna Place, Lynn. Their names are Llewellyn and Arthur Lewis.

Joseph Jenks, who became the founder of a noted New England family, purchased from Richard Leader on January 20, 1647, the privilege of building a forge at the Lynn iron works for the manufacture of scythes and other edge tools. This enterprise was successful. In 1652 he made at these iron works, for the mint which was that year established at Boston, the dies for the first silver pieces coined in New England. On one side of these coins was the impression of a pine tree ; hence the name by which they have since been known, "pine-tree shillings." In 1654 he made for the city of Boston the first fire engine made in America. In 1655 the general court granted him a patent for an improved scythe. His name is also associated with other inventions. He died in 1683. Mr. Hawkes says of the scythe which he invented : "This improvement consisted in lengthening the blade, making it thinner, and welding a square bar on the back to strengthen it, as in the scythe of to-day. Before this the old English blade was short and thick like a bush scythe. This invention lightened the labor and cheered the hearts of merry mowers till the mowing machine of our day superseded the old emblem of the husbandman."

Henry and James Leonard were also skilled workmen at Lynn. They and their descendants were afterwards identified with many colonial iron enterprises. The family name is the most noted in the annals of the New England iron industry. Rev. Dr. Forbes, in referring to the Leonard family in his *Topographical Description of Raynham, with its History*, written in 1793, says that "the circumstance of a family attachment to the iron manufacture is so well known as to render it a common observation in this part of the

country, "Where you can find iron works there you will find a Leonard." Henry and James Leonard are said to have learned their trade at Pontypool, in Monmouthshire. They were forgemen.

The second iron enterprise that was undertaken in New England embraced a furnace and forge at Braintree, in Norfolk county, about ten miles south of Boston. The works at Lynn and Braintree belonged to the same company. Bishop says that on the 19th of November, 1643, a grant of 4,000 acres of the common land at Braintree was made to Mr. Winthrop and his partners, the Lynn company, "for the encouragement of an iron work to be set up about Monotcot river." The true spelling of the name of this river is Monontocot. But this grant, according to Lewis, was not surveyed until January 11, 1648. On the 29th of September, 1645, as stated by Lewis, the first purchase of land, consisting of twenty acres "for a forge at Braintree," was made from George Ruggles by Richard Leader, who was the general agent for the company of undertakers. The furnace was probably built in 1646. Robert Child, writing from Boston on the 15th of March, 1647, to John Winthrop, Jr., "at Pequot river," says of the Lynn and Braintree enterprises: "We have cast this winter some tuns of pots, likewise mortars, stoves, skillets. Our potter is moulding more at Brayntree as yet, which place after another blowing we shall quit, not finding mine there." We find, however, that iron ore was mined at Braintree in the early part of 1652, and that on the 28th of Sepember of that year it was proposed at London on behalf of the undertakers to employ William Osborne at "Brantry furnas & fordges." Operations at the works were suspended in 1653, owing to the scarcity of ore. Henry Leonard it is said to have superintended the erection of the Braintree works, although James Leonard was certainly connected with them, residing at Braintree in 1653, when he removed to Taunton. John Gifford was the manager of the Braintree works, according to Newhall. In 1651 he succeeded Richard Leader as the agent for the works at Lynn. John Adams and his son, John Quincy Adams, were both natives of Braintree.

The next iron enterprise in New England was located in the town, or township, of Taunton (now Raynham), in Bristol county, two miles from the city of Taunton. This enterprise was undertaken in 1652 by a company composed of citizens of Taunton, who employed Henry and James Leonard and Ralph Russell as practical ironworkers. At a town meeting at Taunton, held October 21, 1652, "it was agreed and granted by the town to the said

Henry Leonard and James Leonard, his brother, and Ralph Russell free consent to come hither and join with certain of our inhabitants to set up a bloomery on Two mile river.

The works thus projected were put in operation in 1653.

The Leonards contributed by their skill as iron masters toward making this enterprise a success, and it long continued in a prosperous condition.

Thomas Leonard and his brother James Leonard succeeded their father in the works, and the family name was connected with the Taunton Forge for many generations. Thomas Leonard became manager and so continued until his death in 1713. Bar-Iron was made directly from the ore. The hammers and other heavy iron machinery for the Taunton bloomery came from abroad.

Upon the division of Taunton in 1731, the Iron works were included in the new town of Raynham.

The works made from 20 to 30 tons annually, which brought from £400 to £675, averaging about \$100 a ton of our currency. About a year ago the old buildings were demolished, and the privilege, dam, and the foundation walls alone remain of the ancient Taunton iron works of 224 years—the oldest successful iron manufactory in New England.

The Taunton forge, says Perez Fobes in 1793, was situated on "the great road, and, having been repaired from generation to generation, it is to this day still in employ." In William Reed Deane's *Genealogical Record of the Leonard Family*, published in 1851, it is stated that "the old forge, though it has been several times remodeled, has been in constant use for nearly two hundred years, and is now in the full tide of successful operation. It is owned by Theodore Dean, Esq., who is descended from the Leonards." The forge was at that time employed in the manufacture of anchors. In 1865 it was still so employed, with four forge fires, two hammers, and two water-wheels, but about that time it ceased to be active and has since been abandoned and dismantled.

In 1657 the general court of Massachusetts, owing to the failure of the undertakers at Lynn and Braintree to furnish the colony with a constant supply of iron, "whereby unsufferable damage may accrew," granted to the inhabitants of Concord and Lancaster, and such as they should associate with them, "liberty to erect one or more iron workes, within the limitts of theire oune tounne bounds, or in any common place neer thereunto." That this grant resulted in the establishment of iron works at Concord appears

probable from the grant by the court in 1660, to "y^e company in partnership in the iron worke at Concord," of "free liberty to digg mine without molestation in any lands now in the court's possession."

About 1668 Henry Leonard went to Rowley village, 25 miles northeast of Lynn, as stated by Newhall, "and there established iron works." Lewis says that in 1674 Henry Leonard's sons, Nathaniel, Samuel, and Thomas, contracted to carry on these works for the owners, whose names are given by Bishop as "John Ruck and others of Salem." The works did not prove to be profitable. After establishing the Rowley works Henry Leonard went to New Jersey, "and there again engaged in the iron manufacture." At some time previous to his removal to New Jersey he appears to have been connected with the establishment of iron works at Canton, about fourteen miles south of Boston.

Other iron enterprises in Massachusetts speedily followed those that have been mentioned. In 1677 one of these works, the name of which has not come down to us, was destroyed by the Indians. About the same year iron was made at Topsfield, near Ipswich, and in 1680 its manufacture was commenced at Boxford. Hubbard, writing about 1677, says that at that time there were in the colonies "many convenient places where very good iron, not much inferior to that of Bilbao, may be produced, as at this day is seen in a village near Topsfield, seven or eight miles west from Ipswich." Mr. Tracy, however, informs us that there is a tradition that the Topsfield works were never very productive.

The Whittington iron works, on Mill river, were built by James Leonard, senior, "forgeman," in 1670. These works embraced a "bloomerie with one hearth." Mr. Leonard's three sons, Joseph, Benjamin, and Uriah, having served in the Taunton iron works at the "refining and bloomerie" trade, worked the forge. They also had a grist mill at the same place. This was the location of James Leonard's iron works. James Leonard died in 1691. The Whittington bloomery was continued by his sons and their successors for more than a hundred years. During the first fifty years it was supplied with bog ore mined in the vicinity of "Scadding's moire" and pond, and "along up Mill river to Winneconnet pond."

In the years 1696 and 1697 the Chartley iron works were built on Stony brook, within the limits of Taunton North Purchase. "The iron work and tools required were made at the Taunton iron works." These works were built by Thomas and James Leonard, and embraced only a bloomery for the

manufacture of bar iron. They went into operation in 1698. In 1713 George Leonard became the sole owner of these works and greatly enlarged them. The above enterprise was the origin of the noted Leonard iron works of Norton, and one of the chief causes of the organization and incorporation of that town in 1711. Native bog ore was always used.

A small forge, or "bloomerie," to use bog ore, was built about 1695 "at Taunton line, on the Three mile river, near the present site of North Dighton furnace," by Richard Stevens, "in connection with his son and others." In 1739 these works were enlarged. They appear to have been kept in operation until near the close of the eighteenth century.

"The first hollow-ware manufactory" in the Old Colony of New Plymouth was King's furnace, built on Littleworth brook, in the eastern part of Taunton, in 1724 and 1725, by a stock company of which John King was the principal member; hence the name King's furnace. In 1725 the casting of hollow-ware was commenced, from the size of a pint kettle to a ten-pail cauldron. The ore first used was bog ore found in the neighborhood. This furnace was a successful enterprise. It was rebuilt in 1816, when it "employed about 30 moulders and men, doing a large business." Its wares were even transported to New York "by sloops at Weir village, which on their return brought pig iron and ore from New Jersey." The furnace was in operation for several years after 1839.

The Hopewell iron works embracing a bloomery only, were built on Mill river, in Taunton, in 1739 and 1740, by Captain Zephaniah Leonard, to make bar iron from bog ore. The bloomery was succeeded by a rolling and slitting mill, erected by John Adam in 1776 and 1777. In 1782 the property passed into the hands of Samuel Leonard and others, of Taunton. Russia and Swede iron, imported in bars, were rolled and converted into rods for the best of hammered nails, furnishing partial employment for many farmer nailers within an area of a dozen miles. Finally the business proving unprofitable, the works were abandoned. We pass over other early Taunton iron works.

For a hundred years after its settlement in 1620 Massachusetts was the chief seat of the iron manufacture on this continent. Most of its iron enterprises during this hundred years were ore bloomeries, but there were blast furnaces also, although the latter as a rule produced only hollow-ware and other castings and not pig iron. During the period mentioned the iron industry of Massachusetts was confined to the eastern counties of the colony,

where bog and pond ores formed the only kinds of ore that were obtainable. Charcoal was the only fuel used, and water-power was the only power employed.

The English settlement at New Haven closely followed Massachusetts in the manufacture of iron. John Winthrop, Jr., who removed from Lynn to Pequod, (New London) Connecticut, in 1645, had obtained from the general court in the preceding year permission to set up an iron work, and in 1651 he obtained a grant of certain privileges to enable him to "adventure" in the manufacture of iron ; but he does not seem to have embarked in the iron business until some time subsequently. On May 30, 1655, as we learn from Bishop, it was ordered by the assembly of New Haven "that if an iron worke goe on within any part of this jurisdiction the persons and estates consequently and onely employed in that worke shall be free from paying rates." In 1658 Captain Thomas Clarke, in company with John Winthrop and others, put in operation an "iron worke" at New Haven and in 1669 he seems to have been still engaged in the same enterprise, for in that year the general court of Connecticut continued the exemption already noted for another seven years, "for encouragement of the said worke in supplying the country with good iron and well wrought according to art." This enterprise embraced a blast furnace and a refinery forge. On the 22d of June, 1663, John Davenport wrote from New Haven to John Winthrop, Jr., as follows : "The freshest newes here, & that which is *e re vestra*, is that they have bene blowing at the iron worke, and have runne, from the last 6th day to this 2d day, 5 sowes of iron, which are commended for very good ; & this night it's thought they will run another, & begin to-morrow to make pots. The worke is hopeful, but the workemen are thought to be very chargeable and froward." This frowardness was due apparently to the influence of an old enemy of iron works and ironworkers, John Barleycorn. Bishop records "a proposition made in May, 1662, 'in y^e behalfe of Capt. Clarke, that wine and liquors drawn at the iron workes might be custome free,' which was allowed to the extent of one butt of wine and one barrell of liquors, and no more."

Rhode Island made iron soon after its settlement in 1636, certainly at Pawtucket and elsewhere as early as 1675, when a forge at Pawtucket, erected by Joseph Jenks, Jr., son of Joseph Jenks, the machinist at Lynn, was destroyed by the Indians in the Wampanoag war, as well as other iron works and infant enterprises. A third Joseph Jenks was Governor of Rhode Island from 1727 to 1732. The few iron enterprises that were established in this

colony in the seventeenth century used bog or pond ore, but in the succeeding century rock ore was also used. There is a deposit of magnetic iron ore in Cumberland township, known as Cumberland hill. This hill, or mountain, is described as forming a "homogeneous mass of iron ore, about 500 feet long by 150 feet wide and 104 feet high, or, in bulk, equal to about 1,000,000 tons above water level, while as the deposit shows an indefinite extension in depth, the quantity of this ore may be said to be practically inexhaustible." Hematite ore was found at Cranston.

Iron does not appear to have been made within the limits of Maine, New Hampshire, or Vermont until the eighteen century.

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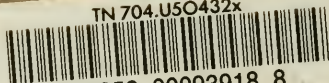
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Old Colony Historical Society, Taunton,
Mass. Executive Committee of the
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